Unit 4 Review Class
Challenging Problems

1) $(x^y - 3)(x^y + 3)$

$x^{2y} - 9$

2)

$$\left(z^r + 5\right)^2$$

$z^{2r} + 10z^r + 25$

3) $(3k^a - 2)^3 = (3k^a - 2)(3k^a - 2)(3k^a - 2)$

$(9k^{2a} - 12k^a + 4)(3k^a - 2)$

$27k^{3a} - 36k^{2a} + 12k^a$

$-18k^{2a} + 24k^a - 8$

$27k^{3a} - 54k^{2a} + 36k^a - 8$

4) $y^{4/3}\left(2y^{2/3}-8y^{5/3}\right) = 2y^{6/3} - 8y^{9/3} = 2y^2 - 8y^3$

5) $\left(x+x^{1/2}\right)\left(x-x^{1/2}\right) = x^2 - x$

6) $\left(x-x^{1/2}\right)^2 = x^2 - 2x^{3/2} + x$

$2 \cdot x \cdot x^{1/2} = 2x^{3/2}$

6b)

$$\left(x + x^{1/2}\right)\left(2x - x^{1/2}\right)$$

$2x^2 - x^{3/2} + 2x^{3/2} - x$

$2x^2 + x^{3/2} - x$

$$\left(r^{\frac{1}{2}} - r^{-\frac{1}{2}}\right)^2 = r - 2r^0 + r^{-1}$$

$$r - 2 + \frac{1}{r}$$

Find the Cofficient of x^3 without finding the entire product.

7)

$$(3x^3 - 4x^2 + 2)(x^3 - 1)$$

$-3x^3$

$+2x^3$

$+1x^3$ -1

8)

$$x^2(4 - 3x)^2$$

$1x^2 \cdot -24x + -24x^3$

-24

Sometimes it helps to perform multiplication vertically.

7b) Multiply

$$(3x^3 - 4x^2 + 2)(x^3 - 1)$$

$3x^6 - 4x^5 + 2x^3$

$-3x^3 + 4x^2 - 2$

$3x^6 - 4x^5 - x^3 + 4x^2 - 2$

7c) Multiply

$$(2x - 3)^3$$

9) $\dfrac{12a^{5x+2}-6a^{3x}}{2a^{x-1}} = \dfrac{12a^{5x+2}}{2a^{x-1}} - \dfrac{6a^{3x}}{2a^{x-1}}$

$6a^{5x+2-(x-1)} - 3a^{3x-(x-1)}$

$6a^{4x+3} - 3a^{2x+1}$

10) $\left(4m^3 - 8m^2 + 4m + 6\right) \div (2m - 1)$

12) $\left(x+\frac{1}{2}\right)^2 = x(x+1)+\frac{1}{4}$

$= x^2 + x + \frac{1}{4}$

$\left(x+\frac{1}{2}\right)^2$

$\left(x \cdot \frac{1}{2}\right)2$

$\left(\frac{1}{2}x\right)2$

x

p 636 #41

$$\left(3\sqrt{x}-\frac{1}{\sqrt{x}}\right)^5 = \left(3x^{1/2}-x^{-1/2}\right)$$

$$243x^{5/2} - 405x^{5/2} + 270x^{+1/2} - \frac{90}{x^{1/2}} + \frac{15}{x^{+3/2}} - \frac{1}{x^{5/2}}$$

p 636 #42

$$\left(m^3 - m^{-2}\right)^4$$

p. 636 #46

Find the last 3 terms of

$$(2a+5b)^{16}$$

Write $\binom{14}{10}$ using combination notation:

Write $\binom{14}{10}$ using factorials. Cancel appropriate factors.